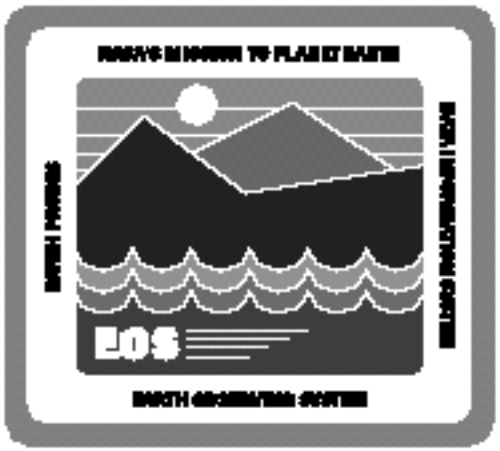


Independent Architecture Studies PDR Relevant Issues

Mark Elkington

13 February 1995

Presentation Roadmap

- System/Segment Context
- Subsystem Functional Overview
- Subsystem CI Overview
- Hardware Overview
- Release IR-1, and A Objectives
- Key Design Changes Since SDR
- CSMS Service Utilization - [*Richard Meyer*]
- End-to-End High Level Scenarios - [*Ron Williamson*]
- Independent Architecture Studies - PDR Relevant Issues

Independent Architecture Studies Review

Three independent study teams led by UCB, GMU, UND

- many good ideas - tended to focus on the areas of team strength rather than the whole system
- independence from ECS resulted in significant overlap with current design
- several programmatic issues raised [e.g.processing focus, DAACs responsibility and structure, user community scope]

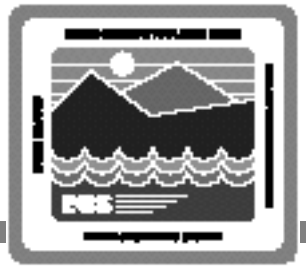
100 recommendations accepted by the review panel and categorised as:

ECS	already included in ECS design
PRG	programmatic assessment as it implies major change to scope of EOSDIS
PDR	considered in the PDR timeframe
EVO	considered as evolutionary development for incorporation post Release B
R&D	potentially interesting for EOSDIS but requires more community R&D before assessment can be made

PDR Recommendations

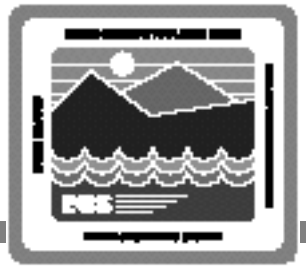
- discuss activity, progress and pointers to more discussion later in the PDR

IAS PDR Relevant Issues



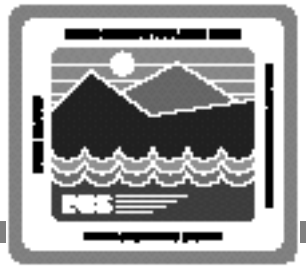
ISSUE	ECS APPROACH	CURRENT STATUS
Routine vs. On-demand Production		
• Support “Eager” and “Lazy” Evaluation • Do Not Preclude Paradigm Shift to “Compute On Demand” • Regularly Cycle Through Archive (“Back-end Filtering”)	• Standard and Ad-hoc Production Requests Will Use Common Interface • Data Server Will Support Requests for “Virtual” Data • Data Server Will Support “User Methods” • Cycling Through Archive Has Commonality With Re-processing • Data Server Architecture Allows Future Evolution to “Back-end Filtering” As An Optimization Issue	PARTIALLY ADOPTED BY ECS: • IAS Concerns Addressed As Evolutionary Features (Examples Presented At This PDR) • Release A Preserves Evolutionary Options • AHWGC Interaction Required to scope and prioritize “Queries from Hell” Issue • Content Based Searching Is Not In Current Requirements Baseline
Support For Pull Diversity and Scalability		
• Need to Support Pull (Within Cost Constraints) • Support Third-Party Providers (Scuhas PARCs, Peer DAACs, etc)	• ECS Is Based on An Open, Service Oriented Architecture • Incremental Development of Pull Components To Allow For Input From Community	ALREADY ADOPTED BY ECS: • ECS Will Issue A Third Party Provider IDD • AHWGC Interaction Required to Quantify and Prioritize Pull Issues

IAS PDR Relevant Issues



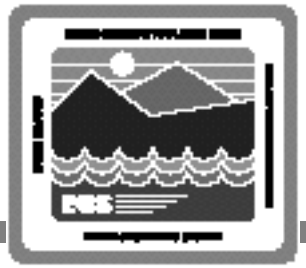
ISSUE	ECS APPROACH	CURRENT STATUS
ECS Data Access Protocols		
• ECS Should Adopt SQL/2 • ECS Should Adopt SQL-* • Migrate to SQL/3 • Use Standard Off-the-shelf Indexed Access Methods • Influence COTS Vendors To Provide Distributed Query Middleware	• ECS Will Use Off-the-Shelf Indexing Technologies • Data Server Architecture Encapsulates Vendor Specifics (Query Language, DBMS Architecture) • ECS Intends to Migrate to SQL/3	PARTIALLY ADOPTED BY ECS: • Query Language Decisions Still Pending - SQL/3 Currently Too Vague - Release A Will Support ODL • Vendor Negotiations Are In Progress, However, ECS Will Not Accept Middleware Based On Proprietary Query Language
ECS Data Management Design		
• ECS Should Incrementally Develop Earth Science Type Library, Query Schema, Data Dictionary • ECS Should Verify Design Using Science User Scenarios and Other Types of User Scenarios	• Data Management and Data Dictionary Subsystems Are Being Developed Incrementally • ECS Design Makes Extensive Use of User Scenarios	ALREADY ADOPTED BY ECS • AHWGC Could Provide Useful Input on Scenario Mix and Priority

IAS PDR Relevant Issues



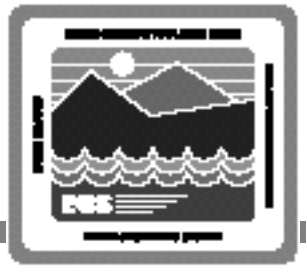
ISSUE	ECS APPROACH	CURRENT STATUS
Miscellaneous Issues		
• Just In Time Hardware Acquisition	• ECS Will Defer Hardware Acquisitions As Long As Is Possible Within Government Procurement Rules	ALREADY ADOPTED BY ECS
• Replace User Help Staff With On-Line Help / WWW Capabilities	• ECS Will Implement An Extensive Web Of Help Information (e.g., Dictionary, Access to Various Levels of Guide Documentation, User Help Information)	INFORMATION WEB APPROACH ALREADY ADOPTED, **BUT:** • ECS Does Not Believe That User Help Staff Should Be Eliminated
• ECS Should Use NFS rather than RPC for Bulk Data Transfer • ECS Should Use “Virtual Client Protocol” To Reduce Network Traffic	• ECS Will Use File Transfer and Distributed File System Protocols for Bulk Data Transfer • ECS Design Employs “Virtual Client”-type Protocol	ALREADY ADOPTED BY ECS

IAS PDR Relevant Issues



ISSUE	ECS APPROACH	CURRENT STATUS
Network Protocols		
• ECS Should Not Use CORBA Now • ECS Should Use SNMP • ECS Should Support TCP/IP based protocols, including SLIP • ECS Should Evolve To ATM, and Be Involved In ATM Field Trials • Influence Standards	• ECS Will Not Use CORBA Until Release C • ECS Is Using SNMP • TCP/IP, SLIP is a non-issue when Dial-Up Support Added at B • ECS Is Prepared For A Likely Move to ATM, and Is Involved With ATM Testbeds • ECS Is Involved In Standards Activities	ALREADY ADOPTED BY ECS:
Miscellaneous CSMS Issues		
• ECS Should Assess Network and TechnologyTrends	• This is An Ongoing Activity Within The CSMS Development Organization	ALREADY ADOPTED BY ECS
• BONeS Simulation of Alternatives to the V0 Inter-DAAC topologies presented by the IAS should be checked	• InterDAAC Networks Are Not ECS Provided	• ECS Modelling of Inter-DAAC traffic will feed ESDIS modelling and procurement activity

Acronyms



AHWGC	Ad Hoc Working Group on Consumers
ATM	Asynchronous Transfer Mode
BONeS	Block-Oriented Network Simulator
CORBA	Common Object Request Broker Architecture
COTS	Commercial Off the Shelf
CSMS	Communications and Systems Management Segment (ECS)
DAAC	Distributed Active Archive Center
DBMS	Database Management System
GMU	George Mason University
IAS	Independent Architecture Studies
IDD	Interface Definition Document
IR-1	Interim Release-1
NFS	Network File System
ODL	Object Data Language
PARC	Public Access Resource Centers
PDR	Preliminary Design Review
R. A	Release A
RPC	Remote Procedure Call
SDR	System Design Review
SLIP	Serial Line Interface Protocol
SNMP	Simple Network Management Protocol
SQL	Structured Query Language
TCP/IP	Transmission Control Protocol/Internet Protocol
UCB	University of Souther California, Berkeley
UND	University of North Dakota